

**RECORD OF DECISION**

**South Post Impact Area and AOC 41 Groundwater and AOCs 25, 26, & 27**

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**RECORD OF DECISION SUMMARY  
SOUTH POST IMPACT AREA AND  
AREA OF CONTAMINATION 41 GROUNDWATER AND  
AREAS OF CONTAMINATION 25, 26, AND 27  
FORT DEVENS, MASSACHUSETTS**

**APPENDIX E**

**TABLES**

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**Table 1**

**SUMMARY OF ANALYTICAL RESULTS  
FOR SPIA WELL D-1**  
( $\mu\text{g/g}$ )

<b>Analyte</b>	<b>Detection Frequency</b>	<b>Range</b>		<b>Local Background 2SM-92-05X</b>	<b>Frequency of Exceedance of Background</b>	<b>Region III RBC for Tapwater</b>	<b>Frequency of Exceedance of RBC and Background</b>
		<b>Minimum</b>	<b>Maximum</b>				
<b>Metals</b>							
Arsenic	2/4	3.80	4.56	<2.54	2/4	11 <sup>b</sup> 0.37 <sup>c</sup>	0/4 2/4
Barium	1/4	-	2.12	13.2	0/4	2,600	0/4
Calcium	4/4	5,480	6,200	2,745	4/4	NR	-
Copper	1/4	-	6.73	<8.09	0/4	1,400 <sup>b</sup>	0/4
Iron	4/4	113	188	2,640	0/4	NR	-
Lead	2/4	2.17	4.23	1.85	2/4	15 <sup>a</sup>	0/4
Magnesium	4/4	1,560	1,760	914	4/4	NR	-
Manganese	3/4	3.18	4.02	68.6	0/4	180 <sup>b</sup>	0/4
Potassium	4/4	568	1,380	1,575	0/4	NR	-
Sodium	3/4	2,470	2,640	2,105	3/4	NR	-
Zinc	1/4	-	40.5	<21.1	1/4	11,000 <sup>b</sup>	0/4
<b>Pesticides</b>							
Endosulfan sulfate	1/4	-	0.260	NA	-	220 <sup>b,c</sup>	0/4
Endosulfane, B	1/4	-	0.006	NA	-	220 <sup>b</sup>	0/4

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Table 1

**SUMMARY OF ANALYTICAL RESULTS  
FOR SPIA WELL D-1**  
( $\mu\text{g/g}$ )

Analyte	Detection Frequency	Range		Local Background 25M-92-05X	Frequency of Exceedance of Background	Region III RBC for Tapwater	Frequency of Exceedance of RBC and Background
		Minimum	Maximum				
<b>Semivolatile Organics</b>							
2-Ethyl-1-hexanol	1/4	-	10.0	NA	-	NR	-
Bis(2-ethylhexyl)phthalate	2/4	10.0	53.0	NA	-	4.8 <sup>c</sup>	2/4
Hexanedioic acid diocylester	1/4	-	9.0	NA	-	NR	-
<b>Volatile Organics</b>							
Chloroform	1/4	-	1.70	NA	-	0.15 <sup>c</sup>	1/4

Source: Ecology and Environment, Inc. 1994

Key: NA = Not analyzed NR = Not reported.

<sup>a</sup> Action level for lead in drinking water<sup>b</sup> RBC associated with a noncancer hazard index of 1<sup>c</sup> RBC associated with a cancer risk of  $10^{-6}$ <sup>d</sup> RBC for endosulfan was used. Toxicities of endosulfan sulfate are similar.

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**Table 2**
**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS (FILTERED)**  
**AOC 25 - EOD RANGE**  
**( $\mu\text{g/L}$ )**

Chemicals	Local Background Concentration			Downgradient Wells		
	Detection Frequency	Range		Detection Frequency	Range	
		Minimum	Maximum		Minimum	Maximum
<b>Metals</b>						
Aluminum	0/1	-	-	2/9	31.6	36
Barium	0/1	-	-	2/9	15.3	16.8
Calcium	1/1	1,850	1,850	9/9	2,280	4,020
Lead	0/1	-	-	1/9	1.41	1.41
Magnesium	0/1	-	-	8/9	537	711
Manganese	1/1	12.4	12.4	6/9	5.1	35.8
Potassium	0/1	-	-	4/9	1,190	1,370
Silver	0/1	-	-	1/9	2.44	2.44
Sodium	0/1	-	-	4/9	1,950	2,510
Zinc	0/1	-	-	1/9	129	129

Source: Ecology and Environment, Inc. 1994.

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Table 3

**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS (UNFILTERED)**  
**AOC 25 - EOD RANGE**  
**( $\mu\text{g/L}$ )**

Chemical	Local Background Concentration			Downgradient Wells		
	Detection Frequency	Range		Detection Frequency	Range	
		Minimum	Maximum		Minimum	Maximum
<b>Metals</b>						
Aluminium <sup>a</sup>	3/3	830	1,690 <sup>b</sup>	19/19	390	920,000
Antimony <sup>a</sup>	0/3	-	-	4/19	3.04	8.12
Arsenic <sup>a</sup>	0/3	-	-	11/19	2.95	87
Barium <sup>a</sup>	3/3	7.67 <sup>b</sup>	13.2 <sup>b</sup>	18/19	5.64	2,440
Beryllium <sup>a</sup>	0/3	-	-	2/19	6.27	9.27
Calcium <sup>a</sup>	3/3	2,170 <sup>b</sup>	2,750 <sup>b</sup>	18/19	2,780	119,000
Chromium <sup>a</sup>	0/3	-	-	14/19	7.48	1,200
Cobalt <sup>a</sup>	0/3	-	-	10/19	11.4	610
Copper <sup>a</sup>	0/3	-	-	13/19	16.2	1,200
Iron <sup>a</sup>	3/3	1,300	2,640 <sup>b</sup>	19/19	1,060	1,300,000
Lead <sup>a</sup>	2/3	1.79 <sup>b</sup>	1.85 <sup>b</sup>	15/19	1.52	400
Magnesium <sup>a</sup>	3/3	693	914	19/19	596	230,000
Manganese <sup>a</sup>	3/3	33.8	68.6 <sup>b</sup>	19/19	15.3	24,000
Nickel <sup>a</sup>	0/3	-	-	10/19	25.1	1,900
Potassium <sup>a</sup>	2/3	801 <sup>b</sup>	1,580 <sup>b</sup>	17/19	1,570	104,000
Selenium	1/3	2.41 <sup>b</sup>	2.41 <sup>b</sup>	0/19	-	-
Sodium <sup>a</sup>	2/3	1,990 <sup>b</sup>	2,110 <sup>b</sup>	16/19	1,950	11,100
Vanadium <sup>a</sup>	0/3	-	-	12/19	12.5	1,100
Zinc	0/3	-	-	14/19	22.1	3,000
<b>Explosives</b>						
2,4,6-Trinitrotoluene <sup>a</sup>	0/3	-	-	1/19	1.62	1.62
Cyclonite (RDX) <sup>a</sup>	0/3	-	-	4/19	0.67	7.88
HMX <sup>a</sup>	0/3	-	-	1/19	1.01	1.01
PETN <sup>a</sup>	0/3	-	-	1/19	89.5	89.5

Source: Ecology and Environment, Inc. 1994

<sup>a</sup> Selected as a COPC<sup>b</sup> Average of field duplicate samples

**RECORD OF DECISION****South Post Impact Area & AOC 41 Groundwater and AOCs 25, 26, & 27****Page E - 5****Table 4**
**SUMMARY OF GROUNDWATER RESULTS (FILTERED)**  
**AOC 26 - ZULA RANGE**  
**( $\mu\text{g/L}$ )**

Chemical	Local Background Concentration			Downgradient Wells		
	Detection Frequency	Range		Detection Frequency	Range	
		Minimum	Maximum		Minimum	Maximum
<b>Metals</b>						
Aluminum	0/1	-	-	1/8	35.8	35.8
Arsenic	0/1	-	-	1/8	5.07	5.07
Barium	0/1	-	-	2/8	5.92	16.4
Calcium	0/1	1,260	1,260	8/8	656	7,920
Iron	0/1	-	-	2/8	48.2	65.6
Lead	0/1	-	-	1/8	1.74	1.74
Magnesium	0/1	-	-	3/8	589	1,080
Manganese	0/1	-	-	7/8	5.87*	62
Potassium	0/1	-	-	2/8	704	1,010
Selenium	0/1	-	-	2/8	1.65*	3.56
Sodium	0/1	-	-	7/8	2,070	3,850
Zinc	0/1	-	-	3/8	20.3	76.7

Source: Ecology and Environment, Inc. 1994

\* Average of field duplicate samples

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**Table 5**
**SUMMARY OF GROUNDWATER RESULTS (UNFILTERED)**  
**AOC-26 - ZULU RANGE**  
**( $\mu\text{g/L}$ )**

Chemical	Background Well 26M-92-01X			Downgradient Well		
	Detection Frequency	Range		Detection Frequency	Range	
		Minimum	Maximum		Minimum	Maximum
<b>Metals</b>						
Aluminum <sup>a</sup>	1/1	6,600	6,600	18/18	116 <sup>b</sup>	24,200
Arsenic <sup>a</sup>	1/1	2.86	2.86	12/18	2.88	100
Barium <sup>a</sup>	1/1	14	14	16/18	5.56 <sup>b</sup>	95.8
Calcium <sup>a</sup>	1/1	1,810	1,810	18/18	1,240	18,100
Chromium <sup>a</sup>	0/1	-	-	6/18	4.9 <sup>b</sup>	26.6
Cobalt <sup>a</sup>	0/1	-	-	2/18	42.4	44.8
Copper <sup>a</sup>	0/1	-	-	3/18	7.72 <sup>b</sup>	32
Iron <sup>a</sup>	1/1	1,600	1,600	18/18	236 <sup>b</sup>	31,300
Lead <sup>a</sup>	1/1	14.9	14.9	12/18	1.41	27
Magnesium <sup>a</sup>	1/1	591	591	18/18	530 <sup>b</sup>	4,830
Manganese <sup>a</sup>	1/1	42.9	42.7	18/18	17.8	1,210
Nickel <sup>a</sup>	0/1	-	-	2/18	10.7	57.6
Potassium <sup>a</sup>	0/1	-	-	14/18	1,173 <sup>b</sup>	5,470
Selenium <sup>a</sup>	1/1	2.11	2.11	1/18	2.05	2.05
Sodium <sup>a</sup>	0/1	-	-	16/18	1,900	6,010
Vanadium <sup>a</sup>	0/1	-	-	2/18	15	24.9
Zinc <sup>a</sup>	0/1	-	-	-	10/18	99.3
<b>Explosives</b>						
1,3-Dinotrobenzene <sup>a</sup>	0/1	-	-	2/18	0.326	1.65
2,6-Ditrotoluene <sup>a</sup>	0/1	-	-	3/18	0.9	5.42
2-Nitrotoluene <sup>a</sup>	1/1	6.02 <sup>b</sup>	6.02 <sup>b</sup>	2/6	10	27
3-Nitrotoluene <sup>a</sup>	0/1	-	-	1/6	1.86	1.86
4-Amino-2,6-dinitrotoluene <sup>a</sup>	0/1	-	-	1/6	0.501 <sup>b</sup>	0.501 <sup>b</sup>
Cyclonite (RDX) <sup>a</sup>	0/1	-	-	10/18	3.53	390
HMX <sup>a</sup>	0/1	-	-	9/18	2.35 <sup>b</sup>	23
Nitroglycerin <sup>a</sup>	0/1	-	-	1/18	36.7 <sup>b</sup>	36.7 <sup>b</sup>

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**Table 5**
**SUMMARY OF GROUNDWATER RESULTS (UNFILTERED)**  
**AOC-26 - ZULU RANGE**  
**( $\mu\text{g/L}$ )**

Chemical	Background Well 26M-92-01X			Downgradient Well		
	Detection Frequency	Range		Detection Frequency	Range	
		Minimum	Maximum		Minimum	Maximum
PETN <sup>a</sup>	0/1	-	-	1/18	17.4 <sup>b</sup>	17.4 <sup>b</sup>
<b>Semivolatile Organics</b>						
Bis(2-ethylhexyl)phthalate <sup>c</sup>	-	-	-	1/12	5.55 <sup>b</sup>	5.55 <sup>b</sup>
Dimethyl phthalate <sup>c</sup>	-	-	-	1/12	7.2	7.2
<b>Volatile Organics</b>						
Acetone	1/1	18	18	0/12	-	-
Carbon disulfide <sup>c</sup>	0/1	-	-	2/12	4.5	22
Carbon tetrachloride <sup>c</sup>	0/1	-	-	1/12	1	1
<b>Other Organics</b>						
Butyl Carbiol <sup>c</sup>	-	-	-	1/1	8	8
2-Ethyl-1-hexanol <sup>c</sup>	-	-	-	1/1	20	20
Benzothiazole <sup>c</sup>	-	-	-	1/1	4	4
Tetracosane <sup>c</sup>	-	-	-	1/1	4	4
Total Petroleum <sup>c</sup> Hydrocarbons	-	-	-	2/12	143 <sup>b</sup>	730 <sup>b</sup>

Source: Ecology and Environment, Inc. 1994

<sup>a</sup> Selected as a COPC<sup>b</sup> Average of field duplicate samples<sup>c</sup> Attributed to sampling or laboratory error<sup>d</sup> Results not confirmed in a second column

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**Table 6**
**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS (FILTERED)**  
**AOC 27 - HOTEL RANGE**  
**( $\mu\text{g/L}$ )**

Chemical	Background Well SPM-93-13X		Downgradient Wells			Frequency of Exceedance of Background Concentration	
	Frequency of Detection	Concentration	Frequency of Detection	Range			
				Minimum	Maximum		
<b>Metals</b>							
Aluminum	1/1	90.1	5/7	9.30	72.3	0/7	
Arsenic	0/1	-	1/7	4.96	4.96	1/7	
Barium	0/1	-	1/7	5.76	6.10	2/7	
Beryllium	0/1	-	5/7	0.087	0.315	5/7	
Calcium	1/1	3,560	7/7	4,530*	11,400	7/7	
Copper	0/1	-	1/7	3.040	3.045*	1/7	
Iron	1/1	37.9	4/7	21.6	37.35*	0/7	
Magnesium	1/1	856	7/7	1,170	2,580	7/7	
Manganese	1/1	45.4	7/7	1.46	74.1	2/7	
Potassium	1/1	1,080	6/7	1,020	2,330	5/7	
Sodium	1/1	1,950	7/7	2,290	10,900	7/7	
Zinc	0/1	-	6/7	7.54	112	6/7	

Source: Ecology and Environment, Inc. 1994

\* Average of field duplicate samples

**RECORD OF DECISION****South Post Impact Area & AOC 41 Groundwater and AOCs 25, 26, & 27****Page E - 9****Table 7**
**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS (UNFILTERED)**  
**AOC 27 - HOTEL RANGE**  
**( $\mu\text{g/L}$ )**

Chemical	Background Well SPM-93-13X		Downgradient Wells				Frequency of Exceedance of Background Concentration	
	Frequency of Detection	Concentration	Frequency of Detection	Range				
				Minimum	Maximum			
<b>Metals</b>								
Aluminum <sup>a</sup>	1/1	34,000	14/14	148	164,000	3/14		
Antimony <sup>a</sup>	1/1	3.06	3/14	6.92	12.9	3/14		
Arsenic <sup>a</sup>	1/1	250	11/14	3.31 <sup>b</sup>	300	1/14		
Barium <sup>a</sup>	1/1	272	14/14	2.62	806	3/14		
Beryllium <sup>a</sup>	1/1	1.68	6/14	0.123	7.3	2/14		
Calcium <sup>a</sup>	1/1	7,820	14/14	4,250 <sup>b</sup>	22,500	9/14		
Chromium <sup>a</sup>	1/1	77.7	11/14	5.44 <sup>b</sup>	288	3/14		
Cobalt <sup>a</sup>	1/1	106	5/14	5.53 <sup>b</sup>	282	2/14		
Copper <sup>a</sup>	1/1	147	12/14	1.62	553	2/14		
Iron <sup>a</sup>	1/1	66,000	14/14	175	305,000	2/14		
Lead <sup>a</sup>	1/1	88.3	11/14	2.95	270	3/14		
Magnesium <sup>a</sup>	1/1	10,300	14/14	1,240	48,300	3/14		
Manganese <sup>a</sup>	1/1	2,400	14/14	29.6	6,540	3/14		
Nickel <sup>a</sup>	1/1	154	8/14	7.7 <sup>b</sup>	522	2/14		
Potassium <sup>a</sup>	1/1	6,860	14/14	1,050	26,300	6/14		
Silver <sup>a</sup>	0/1	-	1/14	1.49	1.49	1/14		
Sodium <sup>a</sup>	1/1	2,860	14/14	2,220	11,100	12/14		
Vanadium <sup>a</sup>	1/1	53.7	9/14	3.89 <sup>b</sup>	264	3/14		
Zinc <sup>a</sup>	1/1	272	14/14	15.1	795	2/14		
<b>Explosives</b>								
Cyclonite <sup>a</sup>	0/1	-	12/14	0.967	17.9	12/14		
1,3-Dinitrobenzene <sup>a</sup>	0/1	-	2/14	0.288	1.82	2/14		
HMX <sup>a</sup>	0/1	-	5/14	0.699	4.74	5/14		

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**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS (UNFILTERED)**  
**AOC 27 - HOTEL RANGE**  
**( $\mu\text{g/L}$ )**

Chemical	Background Well SPM-93-13X		Downgradient Wells				Frequency of Exceedance of Background Concentration	
	Frequency of Detection	Concentration	Frequency of Detection	Range				
				Minimum	Maximum			
<b>Pesticides</b>								
delta-BHC <sup>a</sup>	0/1	-	2/6	0.16	0.26		2/6	
<b>Other Organic Chemicals</b>								
Total Petroleum Hydrocarbons <sup>b</sup>	0/1	-	3/6	350 <sup>b</sup>	3,790		3/6	

Source: Ecology and Environment, Inc. 1994

<sup>a</sup> Selected as COPC<sup>b</sup> Average of duplicate samples

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**CHEMICAL SUMMARY REPORT FOR SURFACE WATERS**  
**AOC 25 - EOD RANGE**  
**( $\mu\text{g/L}$ )**

		Site ID	25D-92-01X
		Field Sample ID	WX2501X1
		Sample Date	10/26/92
Test		Screening Values	
TAL METAL	Aluminum	N/A	19,600
	Arsenic	0.018 ug/l	19.4
	Barium	N/A	40.1
	Calcium	N/A	2,240
	Chromium (total)	11	24.9
	Copper	12	29.7
	Iron	N/A	27,000
	Lead	3.2	18.8
	Magnesium	N/A	4,350
	Manganese	N/A	417
	Potassium	N/A	2,430
	Sodium	N/A	2,880
	Vanadium	N/A	24.7
	Zinc	110	65.6
WQP	Hardness	N/A	10,400
	Nitrogen, Kjeldahl Method	N/A	2,000
	Nitrogen, NO3/NO2	N/A	39.5
	Phosphate	N/A	590
	Total suspended solids	N/A	996,000

Source: USAEC IRDMIS Level 3/E & E, 1994 - Codes following values indicate data usability. (See key above)

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## South Post Impact Area &amp; AOC 41 Groundwater and AOCs 25, 26, &amp; 27

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Table 9

**SUMMARY OF SURFACE WATER RESULTS**  
**AOC 26 - ZULU RANGE ( $\mu\text{g/L}$ )**

Chemical	Local Background Concentration	Detection Frequency	RI DATA			Frequency of Exceedance of Background	SI DATA			Frequency of Exceedence of Background	
			Range		Minimum	Maximum	Detection Frequency	Range			
			Minimum	Maximum				Minimum	Maximum		
<b>Metals</b>											
Aluminum <sup>a</sup>	773	7/13	162	3,780		3/13	8/10	1620	31000	8/10	
Arsenic <sup>a</sup>	6.72	4/13	3.73	7.18 <sup>b</sup>		1/13	8/10	8.09	580	8/10	
Barium <sup>a</sup>	40.1	3/13	5.26	309 <sup>b</sup>		1/13	10/10	2.5	2200	7/10	
Beryllium	5	0/13	-	-		0/13	6/10	0.403	28	1/10	
Cadmium	4.01	0/13	-	-		0/13	5/10	2.91	170	4/10	
Calcium	20600	13/13	1,200	19,300 <sup>b</sup>		0/13	10/10	2400	75000	1/10	
Chromium <sup>a</sup>	6.02	1/13	7.855	7.85 <sup>b</sup>		1/13	9/10	4.99	410	8/10	
Copper	8.1	1/13	10.4725	10.5 <sup>b</sup>		1/13	9/10	8.01	3800	8/10	
Iron <sup>a</sup>	1630	13/13	81.3	11,500 <sup>b</sup>		2/13	10/10	174	50000	8/10	
Lead <sup>a</sup>	8.68	12/13	1.63	106 <sup>b</sup>		2/13	9/10	6.54	9400	8/10	
Magnesium	3340	9/13	667	236 <sup>b</sup>		0/13	10/10	730	47000	3/10	
Manganese	357	13/13	6.65	101		0/13	10/10	9.52	15000	3/10	
Mercury	0.24	0/13	-	-		0/13	1/10	8.2	8.2	1/10	
Nickel	34.4	0/13	-	-		0/13	5/10	11.9	300	1/10	
Potassium	3150	13/13	560	2,860 <sup>b</sup>		0/13	10/10	275	14000	1/10	
Selenium	3.02	1/13	3.895	3.89 <sup>b</sup>		1/13	2/10	4.95	5.54	2/10	

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AOC 26 - ZULU RANGE ( $\mu\text{g/L}$ )**

Chemical	Local Background Concentration	RI DATA				SI DATA				Frequency of Exceedance of Background	
		Detection Frequency	Range		Frequency of Exceedance of Background	Detection Frequency	Range				
			Minimum	Maximum			Minimum	Maximum			
Silver	4.6	0/13			0/13	5/10	0.745	14		1/10	
Sodium	36300	13/13	2,040	3,840	0/13	9/10	2380	3110		0/10	
Vanadium <sup>a</sup>	11	1/13	17	17 <sup>b</sup>	1/13	8/10	5.16	340		7/10	
Zinc <sup>c</sup>	33.4	2/13	53.2	90.3 <sup>b</sup>	2/13	7/10	78	9100		7/10	
<b>Explosives</b>											
1,3,5-Trinitrobenzene	-	0/13	-	-	-	3/10	0.495	0.747		-	
1,3-Dinitrobenzene	-	0/13	-	-	-	2/10	0.321	1.13		-	
Cyclonite <sup>d</sup>	-	3/13	5.76	26.7 <sup>b</sup>	-	3/10	1.46	21.3		-	
HMX <sup>d</sup>	-	1/13	1.8623	1.86 <sup>b</sup>	-	0/10	-	-		-	
<b>Pesticides</b>											
p,p'-DDD <sup>d</sup>	-	1/13	0.086	0.086	-	0/10	-	-		-	
<b>Semivolatile Organics</b>											
4-Methylphenol	-	0/13	-	-	-	1/10	15	15		-	
Bis(2-ethyhexyl) phthalate <sup>d</sup>	-	6/13	4.6	15	-	0/10	-	-		-	

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**Table 9****SUMMARY OF SURFACE WATER RESULTS  
AOC 26 - ZULU RANGE ( $\mu\text{g/L}$ )**

Chemical	Local Background Concentration	RI DATA				SI DATA				Frequency of Exceedence of Background	
		Detection Frequency	Range		Frequency of Exceedance of Background	Detection Frequency	Range				
			Minimum	Maximum			Minimum	Maximum			
<b>Volatile Organics</b>											
1,1,2-Trichloroethane <sup>a</sup>	-	1/13	3	3	-	0/10	-	-	-	-	
Toluene	-	0/13	-	-	-	2/10	13	13	-	-	

Source: Ecology and Environment, Inc. 1994

Note: SI surface water samples contained elevated levels of suspended sediment resulting in artificially high metals concentrations. Metals were selected as COPCs based on the RI data only.

<sup>a</sup> Selected as a COPC

<sup>b</sup> Average of field duplicate samples

<sup>c</sup> Single exceedance is an average of duplicates from location 26D-92-096X; high result is due to elevated concentration of suspended sediments in one of these duplicates. Concentrations found in the other duplicates were well below background value.

<sup>d</sup> Attributed to laboratory or sampling contamination

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**Table 10**
**SUMMARY OF SURFACE WATER ANALYTICAL RESULTS**  
**AOC 27 - CRANBERRY POND**  
**( $\mu\text{g/L}$ )**

<b>Chemical</b>	<b>Detection Frequency</b>	<b>Range</b>		<b>Local Background Concentration</b>	<b>Frequency of Exceedance of Background</b>
		<b>Minimum</b>	<b>Maximum</b>		
<b>Metals</b>					
Aluminum	8/9	10.5	274	773	0/9
Barium	6/9	3.1	4.79	40.1	0/9
Beryllium	2/9	0.105	0.110	5	0/9
Calcium	9/9	760	931	20,600	0/9
Copper	6/9	1.21	2.85	8.1	0/9
Iron	9/9	482	819	1,630	0/9
Lead*	9/9	5.31	18.2	8.68	2/9
Magnesium	6/9	249	280	3,340	0/9
Manganese	9/9	7.21	11.5	357	0/9
Potassium	6/9	579	797	3,150	0/9
Silver	1/9	2.34	2.34	4.6	0/9
Sodium	9/9	854	1,230	36,300	0/9
Zinc	6/9	6.02	24.5	33.4	0/9

Source: Ecology and Environment, Inc. 1994

\* Selected as a COPC

**RECORD OF DECISION****South Post Impact Area & AOC 41 Groundwater and AOCs 25, 26, & 27****Page E - 16****Table 11**

**CHEMICAL SUMMARY REPORT FOR SURFACE WATERS**  
**AOC 25 - EOD RANGE**  
**( $\mu\text{g/g}$ )**

		Site ID	25D-92-01X
		Field Sample ID	DX2501X1
		Sample Date	10/26/92
Test	Parameter	Screening Values	
TAL METAL	Aluminum	1,000,000	10,500
	Arsenic	30	200
	Barium	72,000	15.6
	Beryllium	3.0	1.89
	Calcium	N/A	556
	Chromium (total)	5,000	15.9
	Cobalt	N/A	4.64
	Copper	38,000	14.3
	Iron	N/A	24,100
	Lead	500	11.0
	Magnesium	N/A	3,100
	Manganese	5,100	291
	Nickel	700	18.6
	Potassium	N/A	240
	Selenium	2,500	0.990
	Sodium	N/A	171
	Vanadium	7,200	13.3
	Zinc	5,000	55.5
TCL Pest	DDT	9.0	0.013
TOC	Total Organic Carbon	N/A	15,800

Source: USAECC IRDMIS Level 3/E &amp; E, 1994 - Codes following values indicate data usability. (See key above)

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**Table 12**
**SUMMARY OF RI AND SI SEDIMENT RESULTS  
AOC 26 - ZULU RANGE**  
**( $\mu\text{g/g}$ )**

Chemical	Detection Frequency	Range		Local Sediment Background Concentration	Frequency of Exceedance of Sediment Background	Local Soil Background Concentration	Frequency of Exceedance of Soil Background
		Minimum	Maximum				
<b>Metals</b>							
Aluminum <sup>a</sup>	23/23	2,400	33,100	10,500	5/23	18,000	1/23
Arsenic	18/23	0.643	26	26	0/23	19	2/23
Barium <sup>a</sup>	23/23	9.3	177	26.2	12/23	54	5/23
Beryllium	8/23	0.153	2.48	0.5	2/23	0.81	1/23
Cadmium	2/23	1.2	2.4	0.5	2/23	1.28	1/23
Calcium	21/23	304	10,600	1,100	8/23	810	11/23
Chromium	8/23	8.38	35.3	15.9	2/23	33	1/23
Cobalt	6/23	2.24	11.4	7.2	1/23	4.69	2/23
Copper	19/23	1.33	43.2	14.3	6/23	13.5	6/23
Iron	23/23	1,070	24,500	7,900	4/23	18,000	2/23
Lead	22/23	3.66	100	12.5	13/23	48	4/23
Magnesium	21/23	257	4,180	3,100	3/23	5,500	0/23
Manganese	23/23	15.56	303	600	0/23	380	0.23
Mercury	1/23	0.094	0.094	0.05	1/23	0.108	0/23
Nickel	8/23	4.89	29.5	18.6	2/23	14.6	2/23

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**Table 12**
**SUMMARY OF RI AND SI SEDIMENT RESULTS  
AOC 26 - ZULU RANGE  
( $\mu\text{g/g}$ )**

<b>Chemical</b>	<b>Detection Frequency</b>	<b>Range</b>		<b>Local Sediment Background Concentration</b>	<b>Frequency of Exceedance of Sediment Background</b>	<b>Local Soil Background Concentration</b>	<b>Frequency of Exceedance of Soil Background</b>
		<b>Minimum</b>	<b>Maximum</b>				
Potassium	16/23	190	1,500	292	11/23	2,400	0/23
Selenium	8/23	0.6	4.29	0.13	8/23	0.992	6/23
Sodium	14/23	85.2	1,700	289	7/23	234	10/23
Vanadium	15/23	2.34	31.7	13.3	3/23	32.3	0/23
Zinc	13/23	16.5	80.8	55.6	2/23	43.9	4/23
<b>Explosives</b>							
2,4,6-Trinitrotoluene	1/22	3.71	3.71	-	-	-	-
Cyclonite (RDX)	1/22	10.6	10.6	-	-	-	-
Nitroglycerin	1/22	10.7	10.7	-	-	-	-
<b>Pesticides</b>							
p,p' -DDD	4/23	0.008	0.105	-	-	-	-
p,p' -DDT	2/23	0.016	0.035	-	-	-	-
<b>Semivolatile Organics</b>							
Bis(2-ethylhexyl) - phthalate	3/23	0.482	5.9	-	-	-	-
Diethyl phthalate	1/23	0.765	0.765	-	-	-	-

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**Table 12**

**SUMMARY OF RI AND SI SEDIMENT RESULTS**  
**AOC 26 - ZULU RANGE**  
 $(\mu\text{g/g})$

<b>Chemical</b>	<b>Detection Frequency</b>	<b>Range</b>		<b>Local Sediment Background Concentration</b>	<b>Frequency of Exceedance of Sediment Background</b>	<b>Local Soil Background Concentration</b>	<b>Frequency of Exceedance of Soil Background</b>
		<b>Minimum</b>	<b>Maximum</b>				
<b>Volatile Organics</b>							
Acetone*	3/23	0.12	0.505	-	-	-	-
Ethylbenzene*	1/23	0.205	0.205	-	-	-	-
Toluene*	4/23	0.012	0.6	-	-	-	-
Trichlorofluoromethane	3/23	0.01	0.052	-	-	-	-
<b>Other Organics</b>							
Total Petroleum Hydrocarbons	6/23	52	397	-	-	-	-

Source: Ecology and Environment, Inc. 1994

- \* Selected as a COPC
- † Average of field duplicate samples
- ‡ Elevated above the sediment background value but not above the soil background value; selected as a COPC, but was not carried through the human health risk assessment.
- § Attributed to sampling or laboratory contamination

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**Table 13**

**SUMMARY SEDIMENT ANALYTICAL RESULTS**  
**AOC 27 - CRANBERRY POND**  
 $(\mu\text{g/g})$

<b>Chemical</b>	<b>Detection Frequency</b>	<b>Range</b>		<b>Local Sediment Background Concentration</b>	<b>Frequency of Exceedance of Sediment Background</b>	<b>Local Soil Background Concentration</b>	<b>Frequency of Exceedance of Soil Background</b>
		<b>Minimum</b>	<b>Maximum</b>				
<b>Metals</b>							
Aluminum <sup>d</sup>	9/9	2,630	18,600	10,500	6/9	18,000	1/9
Antimony <sup>a</sup>	1/9	5.59	5.59	0.5	1/9	0.5	1/9
Arsenic <sup>a</sup>	9/9	4.77	28.8	26	1/9	19	1/9
Barium <sup>b</sup>	5/9	8.01	76.1	26.2	2/9	54	2/9
Beryllium <sup>c</sup>	6/9	0.385	0.750	0.5	2/9	0.81	0/9
Calcium	2/9	192	474	1,100	0/9	810	0/9
Chromium <sup>d</sup>	6/9	5.67	33.6	15.9	2/9	33	1/9
Cobalt <sup>b</sup>	1/9	9.55	9.55	7.2	1/9	4.69	1/9
Copper <sup>a</sup>	9/9	7.36	839	14.3	7/9	13.5	7/9
Iron <sup>b</sup>	9/9	5,060	16,800	7,900	4/9	18,000	0/9
Lead <sup>b</sup>	9/9	27	1,400	12.5	9/9	48	8/9
Magnesium	5/9	925 <sup>b</sup>	2,810	3,100	0/9	5,500	0/9
Manganese	9/9	45.7	137	600	0/9	380	0/9
Mercury <sup>a</sup>	1/9	1.08	1.08	0.05	1/9	0.108	1/9
Nickel <sup>b</sup>	9/9	4.7	5.09	18.6	5/9	14.6	6/9
Potassium <sup>c</sup>	1/9	345	345	292	1/9	2,400	0/9
Selenium <sup>b</sup>	1/9	2.6	2.36	0.13	1/9	0.992	1/9

**RECORD OF DECISION****South Post Impact Area & AOC 41 Groundwater and AOCs 25, 26, & 27****Page E - 21****Table 13**

**SUMMARY SEDIMENT ANALYTICAL RESULTS**  
**AOC 27 - CRANBERRY POND**  
 $(\mu\text{g/g})$

Chemical	Detection Frequency	Range		Local Sediment Background Concentration	Frequency of Exceedance of Sediment Background	Local Soil Background Concentration	Frequency of Exceedance of Soil Background
		Minimum	Maximum				
Sodium <sup>a</sup>	3/9	170	3.8	289	1/9	234	1/9
Vanadium <sup>a</sup>	9/9	4.85	68.5	13.3	6/9	32.3	1/9
Zinc <sup>a</sup>	9/9	12.6	396	55.6	6/9	43.9	6/9
<b>Explosives</b>							
4-amino-2,6-dinitrotoluene <sup>a</sup>	2/6	1.90 <sup>b</sup>	3.45	-	-	-	-
<b>Volatile Organics</b>							
Acetone <sup>a</sup>	2/9	0.81	0.960 <sup>b</sup>	-	-	-	-
2-Butanone <sup>a</sup>	2/9	0.145 <sup>b</sup>	0.160	-	-	-	-
Tetrachloroethene <sup>a</sup>	1/3	0.002	0.002	-	-	-	-
<b>Semivolatile Organics</b>							
Benzo(b)flouranthene <sup>a</sup>	1/9	0.33	0.33	-	-	-	-
Pyrene <sup>a</sup>	1/9	0.55	0.55	-	-	-	-
<b>Pesticides</b>							
p,p'-DDD <sup>a</sup>	2/9	0.017	0.090	-	-	-	-
p,p'-DDE <sup>a</sup>	2/9	0.017	0.090	-	-	-	-
p,p'-DDT <sup>a</sup>	1/9	0.019	0.019	-	-	-	-
Methoxychlor <sup>a</sup>	1/9	0.088	0.088	-	-	-	-

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**Table 13**
**SUMMARY SEDIMENT ANALYTICAL RESULTS  
AOC 27 - CRANBERRY POND  
( $\mu\text{g/g}$ )**

<b>Chemical</b>	<b>Detection Frequency</b>	<b>Range</b>		<b>Local Sediment Background Concentration</b>	<b>Frequency of Exceedance of Sediment Background</b>	<b>Local Soil Background Concentration</b>	<b>Frequency of Exceedance of Soil Background</b>
		<b>Minimum</b>	<b>Maximum</b>				
<b>Other Organic Chemicals</b>							
Total Petroleum Hydrocarbons <sup>a</sup>	8/9	46.4	720 <sup>b</sup>	-	-	-	-

Source: Ecology and Environment, Inc. 1994

<sup>a</sup> Selected as a COPC<sup>b</sup> Average of field duplicate samples

• Elevated above the sediment background value, but not above the soil background value

• Single exceedance is less than 35% greater than the background value

• Concentration believed to be attributable to blank contamination

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**Table 14****SUMMARY OF SURFICIAL SOIL ANALYTICAL RESULTS  
AOC 25 - EOD RANGE (µg/g)**

<b>Chemical</b>	<b>Detection Frequency</b>	<b>Range</b>		<b>Local Background Concentration</b>	<b>Frequency of Exceedance of Background</b>
		<b>Minimum</b>	<b>Maximum</b>		
<b>Metals</b>					
Aluminum <sup>a</sup>	1/11	5,170 <sup>c</sup>	32,000	18,000	1/11
Antimony <sup>a</sup>	1/11	2.74	2.74	0.5	1/11
Arsenic	11/11	5.39	12.4	19	0/11
Barium <sup>b</sup>	11/11	10.9	65.4	54	1/11
Beryllium <sup>a</sup>	3/11	0.602	1.85	0.81	2/11
Calcium	4/11	123	301	810	0/11
Chromium <sup>b</sup>	10/11	5.49	25.6	33	1/11
Cobalt <sup>a</sup>	8/11	1.87	6.62	4.69	1/11
Copper <sup>a</sup>	11/11	3.55	54.8	13.5	3/11
Iron <sup>a</sup>	11/11	5,550	24,200	18,000	1/11
Lead <sup>a</sup>	11/11	3.26	54	48	1/11
Magnesium	11/11	476	2,360	5,500	0/11
Manganese <sup>a</sup>	11/11	93.5	809	380	2/11
Mercury <sup>a</sup>	2/11	0.082	0.397	0.108	1/11
Nickel <sup>a</sup>	11/11	5.00	20.3	14.6	1/11
Potassium	8/11	194	669	2,400	0/11
Selenium <sup>b</sup>	11/11	0.412	1.74	0.992	2/11
Sodium <sup>b</sup>	11/11	138	252	234	1/11
Vanadium	11/11	5.12	29.1	32.3	0/11
Zinc <sup>a</sup>	11/11	16.1	92.9	43.9	3/11
<b>Explosives</b>					
Nitrocellulose <sup>a</sup>	2/11	25.8	5550	-	-
Nitroglycerin <sup>a</sup>	1/11	7.18	7.18	-	-
<b>Organics</b>					
Total Petroleum Hydrocarbons <sup>a</sup>	7/11	31.1	45.2	-	-

Source: Ecology and Environment, Inc. 1994

<sup>a</sup> Selected as COPC<sup>b</sup> Single exceedance is less than 25% greater than the background value. This probably reflects natural variability in soil and not site related contamination.<sup>c</sup> Average of field duplicate samples

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**Table 15****SUMMARY OF RI SURFICIAL SOIL RESULTS  
AOC 26 - ZULU RANGE (µg/g)**

Chemical	Detection Frequency	Range		Local Soil Background Concentration	Frequency of Exceedance of Background
		Minimum	Maximum		
<b>Metals</b>					
Aluminum	9/9	5,830	7,780	18,000	0/9
Antimony <sup>a</sup>	1/9	1.19 <sup>b</sup>	1.19 <sup>b</sup>	0.5	1/9
Arsenic <sup>c</sup>	9/9	7.03	20 <sup>b</sup>	19	1/9
Barium	9/9	13	35.5	54	0/9
Beryllium <sup>d</sup>	7/9	0.588	0.945	0.81	2/9
Cadmium <sup>e</sup>	2/9	1.44	1.99	1.28	2/9
Calcium <sup>f</sup>	9/9	146	2520	810	2/9
Chromium	9/9	5.95	10.9	33	0/9
Cobalt	7/9	2.12	4.25	4.69	0/9
Copper <sup>g</sup>	9/9	5.32	30.1	12.5	2/9
Iron	9/9	5,780	10,600	18,000	0/9
Lead <sup>h</sup>	9/9	5.3	89.5 <sup>b</sup>	48	1/9
Magnesium	9/9	474	1,400	5,500	0/9
Manganese	9/9	55.7	167	380	0/9
Nickel	9/9	4.25	9.86	14.6	0/9
Potassium	4/9	348	482	2,400	0/9
Selenium	9/9	0.421	0.778	0.992	0/9
Sodium	9/9	164	227	234	0/9
Vanadium	9/9	6.41	10.9	32.3	0/9
Zinc <sup>i</sup>	9/9	18.5	143	43.9	2/9
<b>Explosives</b>					
Cyclonite <sup>j</sup>	3/15 <sup>d</sup>	0.654	1.1	-	-
HMX <sup>k</sup>	1/15 <sup>d</sup>	1.2	1.2	-	-

**RECORD OF DECISION****South Post Impact Area & AOC 41 Groundwater and AOCs 25, 26, & 27****Page E - 25****Table 15****SUMMARY OF RI SURFICIAL SOIL RESULTS  
AOC 26 - ZULU RANGE (µg/g)**

Chemical	Detection Frequency	Range		Local Soil Background Concentration	Frequency of Exceedance of Background
		Minimum	Maximum		
<b>PCBs</b>					
PCB-1254 <sup>a</sup>	1/9	0.161 <sup>b</sup>	0.161 <sup>b</sup>	-	-
<b>Pesticides</b>					
p,p-DDE <sup>c</sup>	1/9	0.032	0.032	-	-
p,p-DDT <sup>c</sup>	3/9	0.006 <sup>b</sup>	0.037	-	-
Acenaphthylene <sup>c</sup>	1/9	0.064	0.064	-	-
<b>Semivolatile Organics</b>					
Anthracene <sup>c</sup>	2/9	0.055 <sup>b</sup>	0.065	-	-
Benzo(a)anthracene <sup>c</sup>	1/9	0.29	0.29	-	-
Benzo(a)pyrene <sup>c</sup>	1/9	0.38	0.38	-	-
Benzo(b)fluoranthene <sup>c</sup>	1/9	0.81	0.81	-	-
Benzo(k)fluoranthene <sup>c</sup>	2/9	0.15	0.18	-	-
Chrysene <sup>c</sup>	2/9	0.24	0.5	-	-
Di-n-butyl-phthalate <sup>c</sup>	3/9	0.085	0.145 <sup>b</sup>	-	-
Fluoranthene <sup>c</sup>	2/9	0.24	0.29	-	-
Phenanthrene <sup>c</sup>	1/9	0.1	0.1	-	-
Pyrene <sup>c</sup>	2/9	0.13	0.26	-	-
<b>Volatile Organics</b>					
Acetone <sup>c</sup>	1/9	0.029	0.029	-	-
Toluene <sup>c</sup>	1/9	0.001	0.001	-	-
<b>Other Organics</b>					
Total Petroleum Hydrocarbons <sup>c</sup>	4/9	25.1 <sup>b</sup>	34.2	-	-

Source: Ecology and Environment, Inc. 1994

- <sup>a</sup> Selected as a COPC
- <sup>b</sup> Average of field duplicate samples
- <sup>c</sup> Single exceedance is less than 25% greater than the background value. This probably reflects natural variability in the soil and not site-related contamination.
- <sup>d</sup> Includes six surface soil samples from the SI that were analyzed for explosives only
- <sup>e</sup> Attributed to sampling or laboratory contamination

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**Table 16****SUMMARY OF SI SUBSURFACE SOIL SAMPLES  
AOC 26 - ZULU RANGE ( $\mu\text{g/g}$ )**

Chemical	Detection Frequency	Range		Local Soil Background Concentration	Frequency of Exceedance of Background
		Minimum	Maximum		
<b>Metals</b>					
Aluminum	65/66	3,900	18,000	18,000	0/66
Arsenic <sup>a</sup>	64/66	4.3	23	19	1/66
Barium	64/66	4.69	27	54	0/66
Beryllium	36/66	0.097	0.269	0.81	0/66
Cadmium	1/66	0.715	0.715	1.28	0/66
Calcium <sup>a</sup>	64/66	130	1,800	810	10/66
Chromium	48/66	4.5	29.5	33	0/66
Copper <sup>a</sup>	64/66	2.31	41	13.5	7/66
Iron	66/66	260	18,000	18,000	0/66
Lead <sup>a</sup>	58/66	3.14	190	48	4/66
Magnesium <sup>b</sup>	66/66	940	5,900	5,500	1/66
Manganese	66/66	66	370	380	0/66
Mercury	2/66	0.037	0.046	0.108	0/66
Nickel	7/66	3.25	10.3	14.6	0/66
Potassium	66/66	248	1,400	2,400	0/66
Silver <sup>a</sup>	4/66	0.124	0.61	0.086	4/66
Sodium	60/66	55.8	195	234	0/66
Vanadium	66/66	2.32	26.3	32.3	0/66
Zinc <sup>a</sup>	42/66	10.7	220	43.9	3/66
<b>Explosives</b>					
Cyclonite (RDX) <sup>a</sup>	6/66	1.39	38	-	-
HMX <sup>a</sup>	2/66	1.29	3.11	-	-
Tetryl <sup>a</sup>	1/66	2.54	2.54	-	-

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South Post Impact Area &amp; AOC 41 Groundwater and AOCs 25, 26, &amp; 27

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Table 16

**SUMMARY OF SI SUBSURFACE SOIL SAMPLES**  
**AOC 26 - ZULU RANGE ( $\mu\text{g/g}$ )**

Chemical	Detection Frequency	Range		Local Soil Background Concentration	Frequency of Exceedance of Background
		Minimum	Maximum		
<b>Pesticides</b>					
Alpha chlordane <sup>a</sup>	1/66	0.005	0.005	-	-
alpha-Benzenhexachloride <sup>a</sup>	1/66	0.05	0.05	-	-
beta-Benzenhexachloride <sup>a</sup>	1/66	0.015	0.015	-	-
Heptachlor <sup>a</sup>	1/66	0.001	0.001	-	-
p,p'-DDT <sup>a</sup>	3/66	0.023	0.173	-	-
<b>Semivolatile Organics</b>					
2,4-Dimethylphenol <sup>a</sup>	1/66	1.06	1.06	-	-
4-Methylphenol <sup>a</sup>	1/66	1.12	1.12	-	-
Anthracene <sup>a</sup>	1/66	0.353	0.353	-	-
Bis(2-ethylhexyl)phthalate <sup>a</sup>	3/66	0.186	0.465	-	-
Di-n-butyl phthalate <sup>a</sup>	2/66	0.495	1.38	-	-
Fluoranthene <sup>a</sup>	2/66	0.251	0.351	-	-
Pyrene <sup>a</sup>	3/66	0.135	0.239	-	-
<b>Volatile Organics</b>					
Toluene <sup>a</sup>	2/66	0.014	0.027	-	-

Source: Ecology and Environment, Inc. 1994

<sup>a</sup> Selected as a COPC<sup>b</sup> Single exceedance is less than 25% greater than the background value. This probably reflects natural variability in the soil and not site-related contamination.<sup>c</sup> Attributed to sampling or laboratory contamination

**RECORD OF DECISION****South Post Impact Area & AOC 41 Groundwater and AOCs 25, 26, & 27****Page E - 28****Table 17**
**SUMMARY OF SOIL BORING ANALYTICAL RESULTS  
AOC 27 - HOTEL RANGE  
( $\mu\text{g/g}$ )**

Chemical	Detection Frequency	Range		Local Background Concentration	Frequency of Exceedance of Background
		Minimum	Maximum		
<b>Metals</b>					
Aluminum <sup>c</sup>	22/22	1,350 <sup>b</sup>	20,000	18,000	1/22
Antimony <sup>a</sup>	1/22	2.84	2.84	0.5	1/22
Arsenic <sup>c</sup>	22/22	3.33	24.0	19	2/22
Barium <sup>a</sup>	22/22	7.04 <sup>b</sup>	106	54	1/22
Beryllium <sup>a</sup>	9/22	0.584	1.78	0.81	3/22
Calcium <sup>a</sup>	12/22	201	1,770	810	4/22
Chromium <sup>b</sup>	22/22	2.99 <sup>b</sup>	38.4	33	2/22
Cobalt <sup>a</sup>	22/22	2.07	60	4.69	15/22
Copper <sup>a</sup>	12/22	12.0	31.4	13.5	10/22
Iron <sup>a</sup>	22/22	2,800 <sup>b</sup>	29,600	18,000	2/22
Lead	22/22	1.59 <sup>b</sup>	24	48	0/22
Magnesium <sup>c</sup>	20/22	791	6,930	5,500	1/22
Manganese <sup>a</sup>	22/22	55.6 <sup>b</sup>	525	380	5/22
Mercury <sup>a</sup>	2/22	0.073	0.163	0.108	1/22
Nickel <sup>a</sup>	22/22	9.69	29.9	14.6	10/22
Potassium <sup>a</sup>	22/22	3.69	5,080	2,400	1/22
Selenium	7/22	0.402	0.956	0.992	0/22
Sodium <sup>a</sup>	11/22	161	360.0	234	2/22
Vanadium <sup>a</sup>	22/22	3.4	41.1	32.3	1/22
Zinc <sup>a</sup>	22/22	7.51	78.2	43.9	5/22
<b>Volatile Organics</b>					
Tetrachloroethene <sup>a</sup>	-	-	-	-	-

**RECORD OF DECISION****South Post Impact Area & AOC 41 Groundwater and AOCs 25, 26, & 27****Page E - 29****Table 17**
**SUMMARY OF SOIL BORING ANALYTICAL RESULTS  
AOC 27 - HOTEL RANGE  
( $\mu\text{g/g}$ )**

Chemical	Detection Frequency	Range		Local Background Concentration	Frequency of Exceedance of Background
		Minimum	Maximum		
Toluene*	-	-	-	-	-
<b>Semivolatile Organics</b>					
Di-n-butylphthalate*	1/22	1.4	1.4	-	-
Trichlorofluoromethane*	3-22	0.008	0.01	-	-
<b>Pesticides</b>					
Endosulfane A*	1/22	0.006	0.006	-	-
p,p'-DDD*	1/22	0.003	0.003	-	-
p,p'-DDT*	1/22	0.007	0.007	-	-
<b>Other Organic Chemicals</b>					
Total Petroleum Hydrocarbons*	8/22	29.3	75.6	-	-

Source: Ecology and Environment, Inc. 1994

\* Selected as COPC

\* Single exceedance is less than 30% greater than the background value. This probably reflects natural variability in soil and not site related contamination.

\* Average of field duplicate samples

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**Table 18****CHEMICALS OF POTENTIAL CONCERN  
AOC 25 - EOD RANGE**

<b>Chemical</b>	<b>Surface Soils</b>	<b>Subsurface Soils</b>	<b>Groundwater</b>
<b>Metals</b>			
Aluminum	X		X
Antimony	X		X
Arsenic			X
Barium			X
Beryllium	X	X	X
Calcium			X
Chromium			X
Cobalt	X	X	X
Copper	X	X	X
Iron	X	X	X
Lead			X
Magnesium			X
Manganese	X	X	X
Mercury	X		
Nickel	X	X	X
Potassium			X
Selenium	X		
Sodium			X
Vanadium			X
Zinc	X	X	X
<b>Explosives</b>			
Nitrocellulose	X		
Nitroglycerin	X		
2,4,6-Trinitrotoluene			X
Cyclonite (RDX)			X
PETN			X
HMX			X

**RECORD OF DECISION****South Post Impact Area & AOC 41 Groundwater and AOCs 25, 26, & 27****Page E - 31****Table 18****CHEMICALS OF POTENTIAL CONCERN  
AOC 25 - EOD RANGE**

<b>Chemical</b>	<b>Surface Soils</b>	<b>Subsurface Soils</b>	<b>Groundwater</b>
<b>Volatile Organics</b>			
Tetrachloroethene	X	X	
<b>Other Organics</b>			
Total petroleum hydrocarbons	X	X	

Source: Ecology and Environment, Inc. 1994

Note: Groundwater COPC selection is based on unfiltered groundwater data.

Key: X = Selected as a COPC for the human health risk assessment

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South Post Impact Area &amp; AOC 41 Groundwater and AOCs 25, 26, &amp; 27

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Table 19

**CHEMICALS OF POTENTIAL CONCERN**  
**AOC 26 - ZULU RANGE**

Chemical	Surface Soil	Subsurface Soil	Sediment	Surface Water	Groundwater
<b>Metals</b>					
Aluminum			X	X	X
Antimony	X				
Arsenic					X
Barium			X	X	X
Beryllium	X		X		
Cadmium			X		
Calcium	X	X	X		X
Chromium			X		X
Cobalt			X		
Copper	X	X	X		X
Iron			X	X	
Lead	X	X	X	X	X
Magnesium			E		X
Manganese					X
Mercury			E		
Nickel			X		X
Potassium			E		X
Selenium			X		X
Silver		X			
Sodium			X		X
Vanadium			E		X
Zinc	X	X	X		X
<b>Explosives</b>					
4-Amino-2,6-dinitrotoluene					X
1,3-Dinitrotoluene					X
2,6-Dinitrotoluene					X
2-Nitrotoluene					X
3-Nitrotoluene					

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**Table 19****CHEMICALS OF POTENTIAL CONCERN  
AOC 26 - ZULU RANGE**

<b>Chemical</b>	<b>Surface Soil</b>	<b>Subsurface Soil</b>	<b>Sediment</b>	<b>Surface Water</b>	<b>Groundwater</b>
2,4,6 Trinitrotoluene			X		
Nitroglycerin			X		X
Cyclonite (RDX)	X	X	X	X	X
HMX	X	X		X	X
Tetryl		X			
PETN					X
<b>Pesticides/PCBs</b>					
PCB 1254	X				
p,p'-DDD			X	X	
p,p'-DDE	X				
p,p'-DDT	X	X	X		
Heptachlor		X			
alpha-Benzene hexachloride		X			
beta-Benzene hexachloride		X			
<b>Semi-volatile Organics</b>					
2,4-Dimethylphenol		X			
4-Methylphenol		X			
Acenaphthylene	X				
Anthracene	X	X			
Benzo(a)anthracene	X				
Benzo(a)pyrene	X				
Benzo(b)fluoranthene	X				
Benzo(k)fluoranthene	X				
Fluoranthene	X	X			
Phenanthrene	X				
Pyrene	X	X			
<b>Volatile Organics</b>					
Acetone			X		

**RECORD OF DECISION****South Post Impact Area & AOC 41 Groundwater and AOCs 25, 26, & 27****Page E - 34****Table 19****CHEMICALS OF POTENTIAL CONCERN  
AOC 26 - ZULU RANGE**

<b>Chemical</b>	<b>Surface Soil</b>	<b>Subsurface Soil</b>	<b>Sediment</b>	<b>Surface Water</b>	<b>Groundwater</b>
Ethylbenzene			X		
1,1,2-Trichloroethane				X	
Toluene	X	X	X		
Trichlorofluoromethane			X		
Carbon disulfide					X
Carbon tetrachloride					X
<b>Other Organics</b>					
Total petroleum hydrocarbons	X		X		X
Butyl-carbitol					X
2-Ethyl-1-hexanol					X
Benzothiazole					X
Tetraacosane					X

Source: Ecology and Environment, Inc., 1994.

Note: Groundwater COPC selection is based on unfiltered groundwater data.

Key: E = Elevated above sediment background levels but not soil background levels  
 X = Selected as a COPC for the human health risk assessment.

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South Post Impact Area &amp; AOC 41 Groundwater and AOCs 25, 26, &amp; 27

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**Table 20****CHEMICALS OF POTENTIAL CONCERN  
AOC 27 - HOTEL RANGE**

<b>Chemical</b>	<b>Soils</b>	<b>Sediment</b>	<b>Surface Water</b>	<b>Groundwater</b>
<b>Metals</b>				
Aluminum		E		X
Antimony	X	X		X
Arsenic		X		X
Barium	X	X		X
Beryllium	X	E		X
Calcium	X			X
Chromium	X	E		X
Cobalt	X	X		X
Copper	X	X		X
Iron	X	E		X
Lead		X	X	X
Magnesium				X
Manganese	X			X
Mercury	X	X		
Nickel	X	X		X
Potassium	X	E		X
Selenium		X		
Silver				X
Sodium	X	X		X
Vanadium	X	X		X
Zinc	X	X		X
<b>Explosives</b>				
Cyclonite (RDX)				X
1,3-Dinitrobenzene				X
HMX				X

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South Post Impact Area &amp; AOC 41 Groundwater and AOCs 25, 26, &amp; 27

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**Table 20****CHEMICALS OF POTENTIAL CONCERN  
AOC 27 - HOTEL RANGE**

<b>Chemical</b>	<b>Soils</b>	<b>Sediment</b>	<b>Surface Water</b>	<b>Groundwater</b>
<b>Volatile Organics</b>				
Acetone		X		
2-Butanone		X		
Tetrachloroethene	X	X		
Toluene	X			
<b>Semivolatile Organics</b>				
Benz(a)fluoranthene		X		
Pyrene		X		
Trichlorofluoromethane	X			
<b>Pesticides</b>				
delta-BHC				X
Endosulfan A	X			
Methoxychlor		X		
p,p'-DDE	X	X		
p,p'-DDT	X	X		
p,p'-DDD		X		
<b>Other Organic Chemicals</b>				
Total petroleum hydrocarbons	X	X		X

Source: Ecology and Environment, Inc. 1994

Note: Groundwater COPC selection is based on unfiltered groundwater data

Key: E = Elevated above sediment background levels but not soil background levels.

X = Selected as a COPC for the human health risk assessment.

**RECORD OF DECISION****South Post Impact Area & AOC 41 Groundwater and AOCs 25, 26, & 27****Page E - 37****Table 21****RISK FROM USE OF WELL D-1 GROUNDWATER  
AOC 41 - UNAUTHORIZED DUMPING SITE (SITE A)**

<b>Analyte</b>	<b>Maximum Concentration Detected (µg/L)</b>	<b>Non-carcinogenic Risks (HI)</b>	<b>Carcinogenic Risks</b>	
			<b>10 Year Exposure Duration</b>	<b>2 Year Exposure Duration</b>
Arsenic	4.56	$1.7 \times 10^{-2}$	$1.3 \times 10^{-6}$	$2.6 \times 10^{-7}$
Barium	2.12	$3.3 \times 10^{-5}$	-	-
Copper	6.73	$2.0 \times 10^{-4}$	-	-
Manganese	4.02	$8.8 \times 10^{-4}$	-	-
Zinc	40.5	$1.5 \times 10^{-4}$	-	-
Bis(2-ethylhexyl)phthalate <sup>1</sup>	53.0	$2.9 \times 10^{-3}$	$1.2 \times 10^{-7}$	$2.3 \times 10^{-8}$
Endosulfane Sulfate	0.26	$4.8 \times 10^{-5}$		-
Endosulfane, B	0.006	$1.1 \times 10^{-6}$		-
Chloroform	1.7	$1.9 \times 10^{-4}$	$1.6 \times 10^{-9}$	$3.2 \times 10^{-10}$

Source: ABB 1996.

<sup>1</sup> Bis(2-ethylhexyl)phthalate is thought to result from sampling or laboratory error.

**RECORD OF DECISION****South Post Impact Area & AOC 41 Groundwater and AOCs 25, 26, & 27****Page E - 38****Table 22****SUMMARY OF EXCESS CANCER RISKS ASSOCIATED WITH  
AOC 25 - EOD RANGE**

Pathway	Case	Receptor		Risk Contribution by Exposure Route*
		Adult	Adolescent	
Worker Soil Contact	RME	$1.2 \times 10^{-6}$	-	Soil Ingestion - 76% Dermal Contact - 24% Particle Inhalation - <1%
	Average	$3.3 \times 10^{-6}$	-	
Trespasser Soil Contact	RME	$1.7 \times 10^{-6}$	$4.2 \times 10^{-6}$	Soil Ingestion - 77% Dermal Contact - 22% Particle Inhalation - <1%
	Average	$4.8 \times 10^{-6}$	$1.2 \times 10^{-6}$	

Source: Ecology and Environment, Inc. 1994

\*RME case for receptor showing greatest risk

**Table 23****SUMMARY OF ESTIMATED HAZARD INDICES FOR NONCARCINOGENIC EFFECTS ASSOCIATED WITH  
AOC 25 - EOD RANGE**

Pathway	Case	Receptor		Risk Contribution by Exposure Route*
		Adult	Adolescent	
Worker Soil Contact*	RME	$1.1 \times 10^{-3}$	-	Soil Ingestion - 71% Dermal Contact - 28% Particle Inhalation - 1%
	Average	$3.6 \times 10^{-4}$	-	
Trespasser Soil Contact*	RME	$1.3 \times 10^{-3}$	$1.3 \times 10^{-3}$	Soil Ingestion - 74% Dermal Contact - 23% Particle Inhalation - 3%
	Average	$4.2 \times 10^{-4}$	$4.3 \times 10^{-4}$	

Source: Ecology and Environment, Inc. 1994

\* RME case for receptor showing greatest risk

\* Hazard indices for the site worker and adolescent trespasser were calculated using subchronic RfDs.

**RECORD OF DECISION****South Post Impact Area & AOC 41 Groundwater and AOCs 25, 26, & 27****Page E - 39****Table 24****SUMMARY OF EXCESS CANCER RISKS ASSOCIATED WITH  
AOC 26 - ZULU RANGE**

Pathway	Case	Receptor		Risk Contribution by Exposure Route <sup>a</sup>
		Adult	Adolescent	
Worker Soil Contact	RME	$5.3 \times 10^{-4}$	-	Soil Ingestion - 78% Dermal Contact - 21% Particle Inhalation - <1%
	Average	$1.5 \times 10^{-4}$	-	
Trespasser Soil Contact	RME	$5.2 \times 10^{-4}$	$1.3 \times 10^{-4}$	Soil Ingestion - 80% Dermal Contact - 19% Particle Inhalation - <1%
	Average	$1.4 \times 10^{-4}$	$3.5 \times 10^{-4}$	
Trespasser Sediment Contact	RME	$1.3 \times 10^{-4}$	$3.1 \times 10^{-4}$	Sediment Ingestion - 77% Dermal Contact - 23%
	Average	$2.9 \times 10^{-4}$	$7.0 \times 10^{-4}$	
Recreational Fisherman, Fish Consumption	RME	$8.9 \times 10^{-4}$	$2.0 \times 10^{-4}$	Fish Consumption - 100%
	Average	$2.1 \times 10^{-4}$	$5.2 \times 10^{-4}$	

Source: Ecology and Environment, Inc. 1994

<sup>a</sup>RME case for receptor showing greatest risk**Table 25****SUMMARY OF ESTIMATED HAZARD INDICES FOR  
NONCARCINOGENIC EFFECTS ASSOCIATED WITH  
AOC 26 - ZULU RANGE**

Pathway	Case	Receptor		Risk Contribution by Exposure Route <sup>a</sup>
		Adult	Adolescent <sup>b</sup>	
Worker Soil Contact	RME	$3.2 \times 10^{-3}$	-	Soil Ingestion - 38% Dermal Contact - 62% Particle Inhalation - <1%
	Average	$7.5 \times 10^{-4}$	-	
Trespasser Soil Contact	RME	$1.0 \times 10^{-3}$	$1.1 \times 10^{-3}$	Soil Ingestion - 46% Dermal Contact - 54% Particle Inhalation - <1%
	Average	$2.3 \times 10^{-4}$	$2.5 \times 10^{-4}$	
Trespasser Sediment Contact	RME	$1.2 \times 10^{-3}$	$1.4 \times 10^{-3}$	Sediment Ingestion - 70% Dermal Contact - 30%
	Average	$3.4 \times 10^{-4}$	$4.0 \times 10^{-4}$	
Recreational Fisherman, Fish Consumption	RME	$2.3 \times 10^{-3}$	$2.9 \times 10^{-3}$	Fish Consumption - 100%
	Average	$5.9 \times 10^{-4}$	$7.3 \times 10^{-4}$	

Source: Ecology and Environment, Inc. 1994

<sup>a</sup>RME case for receptor showing greatest risk<sup>b</sup>Hazard indices for the adolescent trespasser were calculated using subchronic RfDs

**RECORD OF DECISION****South Post Impact Area & AOC 41 Groundwater and AOCs 25, 26, & 27****Page E - 40****Table 26****SUMMARY OF EXCESS CANCER RISKS ASSOCIATED WITH  
AOC 27 - HOTEL RANGE**

Pathway	Case	Receptor		Risk Contribution by Exposure Route*
		Adult	Adolescent	
Worker Soil Contact	RME	$2.9 \times 10^{-4}$	-	Soil Ingestion - 71% Dermal Contact - 22% Particle Inhalation - 7%
	Average	$2.1 \times 10^{-4}$	-	
Trespasser Soil Contact	RME	$1.7 \times 10^{-4}$	$4.1 \times 10^{-4}$	Soil Ingestion - 76% Dermal Contact - 22% Particle Inhalation - 2%
	Average	$1.2 \times 10^{-4}$	$3.0 \times 10^{-4}$	
Trespasser Sediment Contact	RME	$1.2 \times 10^{-7}$	$2.8 \times 10^{-4}$	Sediment Ingestion - 78% Dermal Contact - 22%
	Average	$7.7 \times 10^{-9}$	$1.9 \times 10^{-4}$	

Source: Ecology and Environment, Inc. 1994

\*RME case for receptor showing greatest risk

**Table 27****SUMMARY OF ESTIMATED HAZARD INDICES FOR  
NONCARCINOGENIC EFFECTS ASSOCIATED WITH  
AOC 27 - HOTEL RANGE**

Pathway	Case	Receptor		Risk Contribution by Exposure Route*
		Adult	Adolescent	
Worker Soil Contact*	RME	$1.9 \times 10^{-3}$	-	Soil Ingestion - 63% Dermal Contact - 19% Particle Inhalation - 18%
	Average	$1.0 \times 10^{-2}$	-	
Trespasser Soil Contact*	RME	$7.7 \times 10^{-4}$	$7.9 \times 10^{-4}$	Soil Ingestion - 76% Dermal Contact - 19% Particle Inhalation - 5%
	Average	$4.2 \times 10^{-4}$	$4.4 \times 10^{-4}$	
Trespasser Sediment Contact*	RME	$5.0 \times 10^{-3}$	$5.9 \times 10^{-3}$	Sediment Ingestion - 59% Dermal Contact - 41%
	Average	$7.9 \times 10^{-4}$	$9.3 \times 10^{-4}$	

Source: Ecology and Environment, Inc. 1994

\*RME case for receptor showing greatest risk

\*Hazard indices for the site worker and adolescent trespasser were calculated using subchronic RfDs

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**Table 28**
**SUMMARY OF HAZARD QUOTIENTS FOR ENDPOINT SPECIES  
AVERAGE EXPOSURE CASE  
AOC 25 - EOD RANGE**

<b>Chemicals</b>	<b>White-footed Mouse</b>			<b>Killdeer</b>			<b>Red Fox</b>		
	<b>EE</b>	<b>TRV</b>	<b>HQ</b>	<b>EE</b>	<b>TRV</b>	<b>HQ</b>	<b>EE</b>	<b>TRV</b>	<b>HQ</b>
Mercury	$1.38 \times 10^{-3}$	$7.0 \times 10^{-3}$	$1.97 \times 10^{-1}$	$8.38 \times 10^{-4}$	$1.6 \times 10^{-3}$	$5.24 \times 10^{-2}$	$2.93 \times 10^{-3}$	$5.0 \times 10^{-3}$	$5.86 \times 10^{-3}$
Zinc	9.95	$8 \times 10^1$	$1.24 \times 10^{-1}$	$5.47 \times 10^{-1}$	$1.09 \times 10^2$	$5.02 \times 10^{-3}$	$3.52 \times 10^{-3}$	$4.0 \times 10^1$	$8.81 \times 10^{-3}$
Nitroglycerin	1.79	1.72	1.04	$7.43 \times 10^{-2}$	NA	NA	$1.74 \times 10^{-4}$	$4.3 \times 10^{-1}$	$4.04 \times 10^{-4}$

Source: Ecology and Environment, Inc. 1994

Key: EE = Estimated exposure (mg/kg-day) HQ = Hazard quotient TRV = Toxicity reference value (mg/kg-day) NA = Not available

**Table 29**
**SUMMARY OF HAZARD QUOTIENTS FOR ENDPOINT SPECIES  
RME CASE  
AOC 25 - EOD RANGE**

<b>Chemicals</b>	<b>White-footed Mouse</b>			<b>Killdeer</b>			<b>Red Fox</b>		
	<b>EE</b>	<b>TRV</b>	<b>HQ</b>	<b>EE</b>	<b>TRV</b>	<b>HQ</b>	<b>EE</b>	<b>TRV</b>	<b>HQ</b>
Mercury	$8.54 \times 10^{-3}$	$7.0 \times 10^{-3}$	1.22	$5.2 \times 10^{-3}$	$1.6 \times 10^{-3}$	$3.25 \times 10^{-1}$	$1.82 \times 10^{-4}$	$5.0 \times 10^{-3}$	$3.63 \times 10^{-3}$
Zinc	$2.87 \times 10^1$	$8 \times 10^1$	$3.59 \times 10^{-1}$	1.58	$1.09 \times 10^2$	$1.45 \times 10^2$	$1.02 \times 10^{-3}$	$4.0 \times 10^1$	$2.54 \times 10^{-4}$
Nitroglycerin	5.21	1.72	3.03	$2.45 \times 10^{-1}$	NA	NA	$5.06 \times 10^{-4}$	$4.3 \times 10^{-1}$	$1.18 \times 10^{-3}$

Source: Ecology and Environment, Inc. 1994

Key: EE = Estimated exposure (mg/kg-day) HQ = Hazard quotient TRV = Toxicity reference value (mg/kg-day) NA = Not available

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**Table 30**

**SUMMARY OF HAZARD QUOTIENTS FOR AQUATIC ENDPOINT SPECIES  
AVERAGE EXPOSURE CASE  
AOC 26 - ZULU RANGE**

<b>Chemical</b>	<b>Aquatic Invertebrates</b>			<b>Blanding's Turtle</b>			<b>Mink</b>		
	<b>EE</b>	<b>TRV</b>	<b>HQ</b>	<b>EE</b>	<b>TRV</b>	<b>HQ</b>	<b>EE</b>	<b>TRV</b>	<b>HQ</b>
Lead	$1.16 \times 10^1$	8.68	1.34	$3.77 \times 10^{-3}$	1.50	$2.51 \times 10^{-3}$	$1.17 \times 10^{-1}$	6.25	$1.88 \times 10^{-2}$
Zinc	NC	NC	NC	$4.01 \times 10^{-1}$	$1.09 \times 10^2$	$3.68 \times 10^{-3}$	3.47	$4.00 \times 10^1$	$8.68 \times 10^{-2}$
2,4,6 trinitrotoluene	$1.80 \times 10^2$	$4.00 \times 10^1$	4.50	$1.94 \times 10^{-3}$	NA	NA	$1.94 \times 10^{-3}$	1.00	$1.94 \times 10^{-2}$
Cyclonite (RDX)	$6.34 \times 10^2$	$2.59 \times 10^2$	2.45	$9.70 \times 10^{-3}$	NA	NA	$2.28 \times 10^{-2}$	5.00	$4.56 \times 10^{-3}$
HMX	NC	NC	NC	$3.69 \times 10^{-3}$	NA	NA	$1.09 \times 10^{-3}$	$1.25 \times 10^1$	$8.69 \times 10^{-2}$
Nitroglycerin	$3.56 \times 10^2$	$8.60 \times 10^1$	4.14	$4.24 \times 10^{-3}$	NA	NA	$3.75 \times 10^{-3}$	$4.30 \times 10^1$	$8.73 \times 10^{-2}$
p,p'-DDD	$5.00 \times 10^{-2}$	$6.00 \times 10^{-2}$	$8.33 \times 10^{-4}$	$7.68 \times 10^{-3}$	$1.60 \times 10^1$	$4.80 \times 10^{-4}$	$3.37 \times 10^{-4}$	$1.25 \times 10^1$	$2.70 \times 10^{-3}$
p,p'-DDT	NC	NC	NC	$1.39 \times 10^{-4}$	$1.60 \times 10^1$	$1.03 \times 10^{-4}$	$4.80 \times 10^{-4}$	$1.25 \times 10^1$	$3.84 \times 10^{-3}$

Source: Ecology and Environment, Inc. 1994

Key: EE = Estimated exposure (mg/kg-day) HQ = Hazard quotient TRV = Toxicity reference value (mg/kg-day)  
 NA = Not available NC = Not a COPC, therefore, values were not calculated

**RECORD OF DECISION****South Post Impact Area & AOC 41 Groundwater and AOCs 25, 26, & 27****Page E - 43****Table 31**

**SUMMARY OF HAZARD QUOTIENTS FOR TERRESTRIAL ENDPOINT SPECIES  
AVERAGE EXPOSURE CASE  
AOC 26 - ZULU RANGE**

Chemical	Herbaceous Vegetation			White-footed Mouse			Grasshopper Sparrow			Killdeer			Red Fox		
	EE	TRV	HQ	EE	TRV	HQ	EE	TRV	HQ	EE	TRV	HQ	EE	TRV	HQ
Lead	$2.87 \times 10^1$	$1.00 \times 10^2$	$2.87 \times 10^1$	$2.40 \times 10^1$	3.90	$6.15 \times 10^{-3}$	$6.04 \times 10^{-1}$	1.50	$4.03 \times 10^{-1}$	$1.02 \times 10^{-1}$	1.50	$6.8 \times 10^{-2}$	$3.29 \times 10^4$	6.25	$5.26 \times 10^{-3}$
Zinc	$5.07 \times 10^1$	$7.00 \times 10^1$	$7.24 \times 10^1$	$1.57 \times 10^1$	$8.00 \times 10^1$	$1.96 \times 10^1$	$1.72 \times 10^1$	$1.09 \times 10^2$	$1.58 \times 10^{-1}$	3.44	$1.09 \times 10^2$	$3.1 \times 10^2$	$2.32 \times 10^2$	$4.0 \times 10^1$	$5.81 \times 10^4$
Cyclonite (RDX)	1.82	NA	NA	1.26	1.18	1.07	1.28	NA	NA	$2.37 \times 10^{-1}$	NA	NA	$4.89 \times 10^4$	2.50	$1.96 \times 10^4$
HMX	$4.87 \times 10^1$	NA	NA	$1.69 \times 10^1$	$2.50 \times 10^1$	$6.77 \times 10^{-3}$	$1.76 \times 10^{-1}$	NA	NA	$3.24 \times 10^{-2}$	NA	NA	$6.73 \times 10^3$	$1.25 \times 10^1$	$5.38 \times 10^4$
p,p'-DDT	$2.05 \times 10^{-2}$	NA	NA	$1.03 \times 10^{-4}$	$2.50 \times 10^1$	$4.11 \times 10^{-4}$	$3.76 \times 10^{-4}$	$2.90 \times 10^{-1}$	$1.30 \times 10^{-3}$	$6.67 \times 10^{-3}$	$2.90 \times 10^{-1}$	$2.3 \times 10^{-4}$	$1.93 \times 10^7$	$1.25 \times 10^1$	$1.54 \times 10^4$

Source: Ecology and Environment, Inc. 1994

Key: EE = Estimated exposure (mg/kg-day) HQ = Hazard quotient TRV = Toxicity reference value (mg/kg-day)  
 NA = Not available NC = Not a COPC, therefore, values were not calculated

**RECORD OF DECISION****South Post Impact Area & AOC 41 Groundwater and AOCs 25, 26, & 27****Page E - 44****Table 32**

**SUMMARY OF HAZARD QUOTIENTS FOR AQUATIC ENDPOINT SPECIES  
RME CASE  
AOC 26 - ZULU RANGE**

<b>Chemical</b>	<b>Aquatic Invertebrates</b>			<b>Blanding's Turtle</b>			<b>Mink</b>		
	<b>EE</b>	<b>TRV</b>	<b>HQ</b>	<b>EE</b>	<b>TRV</b>	<b>HQ</b>	<b>EE</b>	<b>TRV</b>	<b>HQ</b>
Lead	$1.06 \times 10^2$	<b>8.68</b>	$1.22 \times 10^1$	$2.85 \times 10^{-1}$	<b>1.50</b>	$1.90 \times 10^{-1}$	$8.95 \times 10^{-1}$	<b>6.25</b>	$1.43 \times 10^{-1}$
Zinc	NC	NC	NC	<b>1.74</b>	$1.09 \times 10^2$	$1.60 \times 10^{-2}$	$1.51 \times 10^1$	$4.00 \times 10^1$	$3.77 \times 10^{-1}$
2,4,6 trinitrotoluene	$1.35 \times 10^3$	$4.00 \times 10^1$	$3.38 \times 10^1$	$1.76 \times 10^{-1}$	NA	NA	$1.45 \times 10^{-1}$	<b>1.00</b>	$1.45 \times 10^{-1}$
Cyclonit (RDX)	$4.89 \times 10^3$	$2.59 \times 10^2$	$1.89 \times 10^1$	<b>1.09</b>	NA	NA	$2.53 \times 10^{-1}$	<b>5.00</b>	$5.06 \times 10^{-2}$
HMX	NC	NC	NC	$2.36 \times 10^{-2}$	NA	NA	$6.94 \times 10^{-3}$	$1.25 \times 10^1$	$5.55 \times 10^{-4}$
Nitroglycerin	$1.43 \times 10^3$	$8.60 \times 10^1$	$1.66 \times 10^1$	$1.70 \times 10^{-1}$	NA	NA	$1.50 \times 10^{-1}$	$4.30 \times 10^{-1}$	$3.50 \times 10^{-1}$
p,p'-DDD	$5.00 \times 10^{-65}$	$6.00 \times 10^{-2}$	$8.33 \times 10^{-4}$	$5.31 \times 10^{-4}$	$1.60 \times 10^{-1}$	$3.32 \times 10^{-3}$	$2.33 \times 10^{-3}$	$1.25 \times 10^{-1}$	$1.86 \times 10^{-2}$
p,p'-DDT	NC	NC	NC	$1.39 \times 10^{-4}$	$1.60 \times 10^{-1}$	$8.68 \times 10^{-4}$	$4.05 \times 10^{-4}$	$1.25 \times 10^{-1}$	$3.24 \times 10^{-4}$

Source: Ecology and Environment, Inc. 1994

Key: EE = Estimated exposure (mg/kg-day) HQ = Hazard quotient TRV = Toxicity reference value (mg/kg-day)

NA = Not available NC = Not a COPC, therefore, values were not calculated

**RECORD OF DECISION****South Post Impact Area & AOC 41 Groundwater and AOCs 25, 26, & 27****Page E - 45****Table-33**

**SUMMARY OF HAZARD QUOTIENTS FOR TERRESTRIAL ENDPOINT SPECIES  
RME CASE  
AOC 26 - ZULU RANGE**

Chemical	Herbaceous Vegetation			White-footed Mouse			Grasshopper Sparrow			Killdeer			Red Fox		
	EE	TRV	HQ	EE	TRV	HQ	EE	TRV	HQ	EE	TRV	HQ	EE	TRV	HQ
Lead	$1.90 \times 10^2$	$1.00 \times 10^2$	1.90	1.60	3.90	$4.09 \times 10^{-1}$	4.00	1.50	2.67	$6.78 \times 10^{-1}$	1.50	$4.52 \times 10^{-1}$	$2.18 \times 10^{-3}$	6.25	$3.49 \times 10^{-4}$
Zinc	$2.20 \times 10^2$	$7.00 \times 10^1$	3.14	$6.80 \times 10^1$	$8.00 \times 10^1$	$8.50 \times 10^{-1}$	$7.45 \times 10^1$	$1.09 \times 10^2$	$6.84 \times 10^{-1}$	$1.49 \times 10^1$	$1.09 \times 10^2$	$1.37 \times 10^{-1}$	$1.01 \times 10^{-1}$	$4.00 \times 10^1$	$2.52 \times 10^{-3}$
Cyclonite (RDX)	$3.80 \times 10^1$	NA	NA	$2.63 \times 10^1$	1.18	$2.23 \times 10^1$	$2.68 \times 10^1$	NA	NA	4.94	NA	NA	$1.02 \times 10^{-2}$	2.50	$4.09 \times 10^{-3}$
HMX	3.11	NA	NA	1.08	$2.50 \times 10^1$	$4.32 \times 10^{-2}$	1.12	NA	NA	$2.07 \times 10^{-1}$	NA	NA	$4.30 \times 10^{-4}$	$1.25 \times 10^1$	$3.44 \times 10^{-3}$
p,p'-DDT	$1.73 \times 10^{-1}$	NA	NA	$8.68 \times 10^{-4}$	$2.50 \times 10$	$3.47 \times 10^{-3}$	$3.17 \times 10^{-1}$	$2.90 \times 10^{-1}$	$1.09 \times 10^{-2}$	$5.63 \times 10^{-4}$	$2.90 \times 10^{-1}$	$1.94 \times 10^{-3}$	$1.63 \times 10^{-4}$	$1.25 \times 10^1$	$1.30 \times 10^{-3}$

Source: Ecology and Environment, Inc. 1994

Key: EE = Estimated exposure (mg/kg-day) HQ = Hazard quotient TRV = Toxicity reference value (mg/kg-day)  
 NA = Not available NC = Not a COPC, therefore, values were not calculated

**RECORD OF DECISION****South Post Impact Area & AOC 41 Groundwater and AOCs 25, 26, & 27****Page E - 46****Table 34**

**SUMMARY OF HAZARD QUOTIENTS FOR AQUATIC ENDPOINT SPECIES  
AVERAGE EXPOSURE CASE  
AOC 27 - HOTEL RANGE**

Chemical	Aquatic Invertebrates			Mallard Duck			Raccoon		
	EE	TRV	HQ	EE	TRV	HQ	EE	TRV	HQ
Antimony	1.01	3.00	$3.37 \times 10^{-4}$	$7.96 \times 10^{-4}$	NA	NA	$1.61 \times 10^{-3}$	2.60	$6.21 \times 10^{-4}$
Copper	$1.05 \times 10^1$	$7.00 \times 10^1$	1.50	$1.45 \times 10^{-1}$	$1.20 \times 10^{-1}$	1.21	$4.70 \times 10^{-2}$	$3.00 \times 10^{-1}$	$1.57 \times 10^{-1}$
Lead (sediments)	$2.18 \times 10^1$	$3.10 \times 10^2$	$7.03 \times 10^{-4}$	$4.69 \times 10^{-3}$	6.00	$7.82 \times 10^{-3}$	$7.04 \times 10^{-2}$	6.25	$1.13 \times 10^{-2}$
Lead (surface water)	8.64 ( $\mu\text{g/L}$ )	8.68 ( $\mu\text{g/L}$ )	$9.95 \times 10^{-1}$	NC	NC	NC	NC	NC	NC
Mercury	$1.97 \times 10^{-1}$	$6.90 \times 10^{-1}$	$2.86 \times 10^{-1}$	$6.09 \times 10^{-4}$	$6.40 \times 10^{-3}$	$9.51 \times 10^{-3}$	$7.78 \times 10^{-4}$	$1.00 \times 10^{-2}$	$7.78 \times 10^{-3}$
Nickel	$2.04 \times 10^1$	$3.50 \times 10^1$	$5.83 \times 10^{-1}$	$5.64 \times 10^{-3}$	$3.36 \times 10^1$	$1.68 \times 10^{-4}$	$1.17 \times 10^{-2}$	1.56	$7.52 \times 10^{-3}$
4-amino-2,6-dinitrotoluene	$8.20 \times 10^1$ ( $\mu\text{g/L}$ )	$4.00 \times 10^1$ ( $\mu\text{g/L}$ )	2.05	$6.49 \times 10^{-3}$	NA	NA	$5.81 \times 10^{-4}$	6.90	$8.41 \times 10^{-4}$

Source: Ecology and Environment, Inc. 1994

Key: EE = Estimated exposure (mg/kg-day) HQ = Hazard quotient TRV = Toxicity reference value (mg/kg-day)  
 NA = Not available NC = Not a COPC, therefore, values were not calculated

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Table 35

**SUMMARY OF HAZARD QUOTIENTS FOR AQUATIC ENDPOINT SPECIES  
RME CASE  
AOC 27 - HOTEL RANGE**

Chemical	Aquatic Invertebrates			Mallard Duck			Raccoon		
	EE	TRV	HQ	EE	TRV	HQ	EE	TRV	HQ
Antimony	5.59	3.00	1.86	$4.40 \times 10^{-3}$	NA	NA	$2.17 \times 10^{-3}$	2.60	$8.35 \times 10^{-4}$
Copper	$8.39 \times 10^2$	$7.00 \times 10^1$	$1.20 \times 10^1$	1.16	$1.20 \times 10^1$	9.66	$2.63 \times 10^{-1}$	$3.00 \times 10^{-1}$	$8.77 \times 10^{-1}$
Lead (sediments)	$1.40 \times 10^3$	$3.10 \times 10^2$	4.52	$3.02 \times 10^{-1}$	6.00	$5.03 \times 10^{-2}$	$4.28 \times 10^{-1}$	6.25	$6.84 \times 10^{-2}$
Lead (surface water)	$1.82 \times 10^1$ ( $\mu\text{g/L}$ )	$8.68 \times 10^1$ ( $\mu\text{g/L}$ )	2.10	NC	NC	NC	NC	NC	NC
Mercury	1.08	$6.90 \times 10^{-1}$	1.57	$3.34 \times 10^{-3}$	$6.40 \times 10^{-1}$	$5.22 \times 10^{-4}$	$5.85 \times 10^{-4}$	$1.00 \times 10^{-2}$	$5.85 \times 10^{-2}$
Nickel	$5.09 \times 10^1$	$3.50 \times 10^1$	1.45	$1.41 \times 10^{-2}$	$3.36 \times 10^1$	$4.20 \times 10^{-4}$	$1.64 \times 10^{-2}$	1.56	$1.05 \times 10^{-2}$
4-amino-2,6-dinitrotoluene	$1.69 \times 10^2$ ( $\mu\text{g/L}$ )	$4.00 \times 10^1$ ( $\mu\text{g/L}$ )	4.23	$1.70 \times 10^{-1}$	NA	NA	$1.07 \times 10^{-3}$	6.80	$1.58 \times 10^{-4}$

Source: Ecology and Environment, Inc. 1994

Key: EE = Estimated exposure (mg/kg-day) HQ = Hazard quotient TRV = Toxicity reference value (mg/kg-day)

NA = Not available NC = Not a COPC, therefore, values were not calculated